AEQ

AEQ ARENA

DIGITAL AUDIO MIXER
FOR RADIO BROADCASTING APPLICATIONS

Main Features

The **AEQ ARENA** is a digital mixing console for radio broadcasting applications. It is especially designed for controlling on-air transmissions, and is adaptable to different working situations that arise in today's radio operations. The ARENA includes all the basic features needed in this sort of environment: automatic monitor cut-off, cough muting, fader start, control signalling, control signals for the automation of external equipment, external communications management, intercom, etc.

Thanks to its special characteristics, it easily adapts to different working configurations: autocontrol (self-op), control room-studio, control associated with several studios, mixed configurations, integration into large facilities, etc.

One of the most important virtues of this mixer is its routing capability. The system can make more than 30,000 crosspoints. This routing power makes it possible, for example, for all the system outputs to be summable and re-routable to other outputs; it enables as many n-1 buses or clean-feeds to be created as there are available outputs,

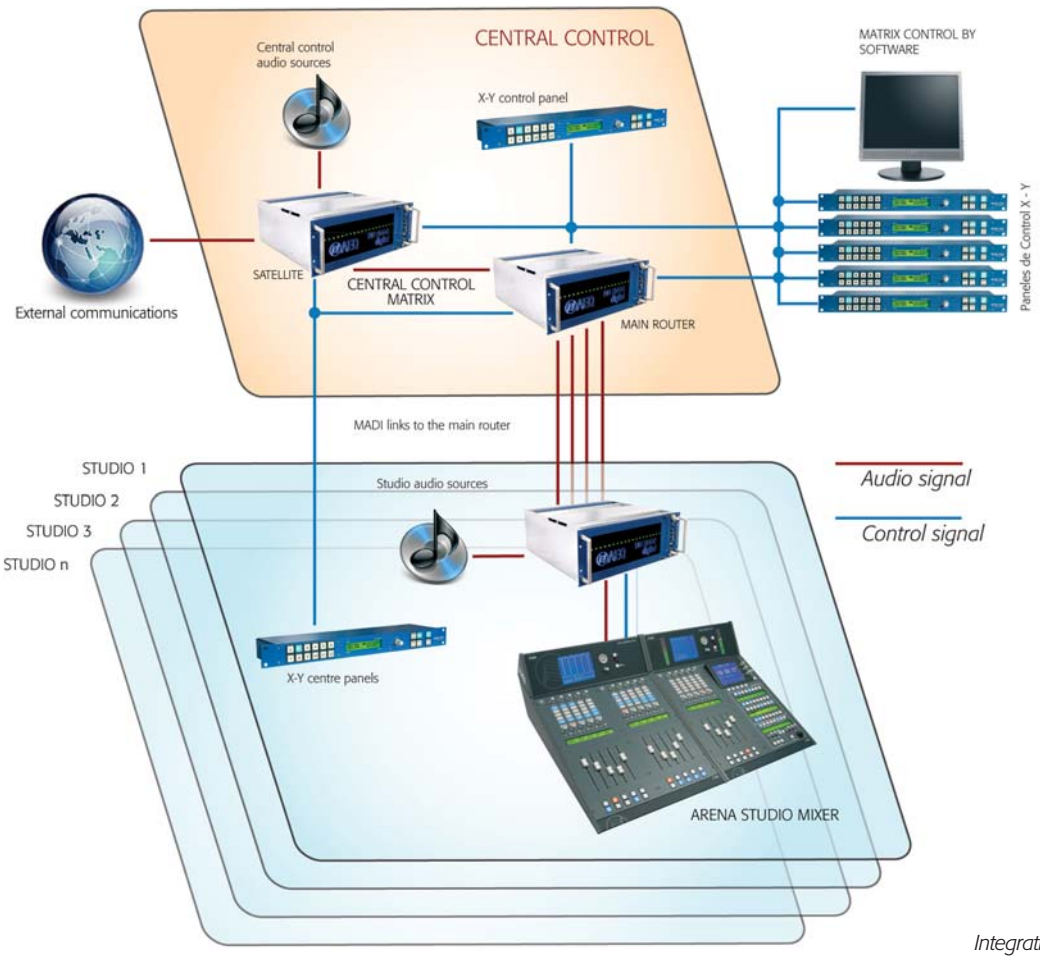
Simplicity and control power are combined to make both the most basic and advanced operating tasks easy.

The flexibility offered by the configuration of the ARENA allows the assignment of the signals present in the system to any control channel, and the modification of that signal distribution can be done from the control surface itself.

THE ARENA CONSOLE WITHIN THE BC 2000 D SYSTEM

The BC 2000 D is a system that can function either as a router or as an audio mixer controlled by the ARENA control surface. The main system components are the same for both. Just by using different firmware, the system can work as a powerful router or a versatile mixer.

With the BC 2000 D, systems can be configured that control, process and route all the audio in a programme production centre, even if it is spread across several facilities within a radius of at least 10 kilometres. The ARENA Console is used as the mixing console in the studios and the matrix is controlled by X-Y panels or software applications.



Integration into large facilities

Power and Development

One of the fundamental concepts on which this digital system is based is the differentiation between control and signal processing. The mixing, processing and, in general, the treatment of audio signals executed by the main BC 2000 D engine. The ARENA control surface provides the control for the mixing system.

With this in mind, the system is scalable according to requirements. Users can implement a range of set-ups, from a system with a very few inputs and outputs to one with more than 100 inputs and outputs. Similarly, the control surface can comprise a system with a greater or lesser number of channels, according to the users' needs: from five to seventy-five physical fader channels.

The new ARENA control surface was developed from the original BC 2000 D mixer control surfaces. With this new control surface, notable improvements have been introduced into the system, such as the possibility of monitoring all the signals present in the system, or the use of memories.

The ARENA incorporates improvements in its exterior design such as dedicated power supplies and styling, in operational capacity and in modularity. During installation, the user can now decide whether they prefer the ON/OFF controls beneath the faders for quicker access, or above them for greater security, since the surface has been redesigned to make it more versatile and adaptable to any situation.

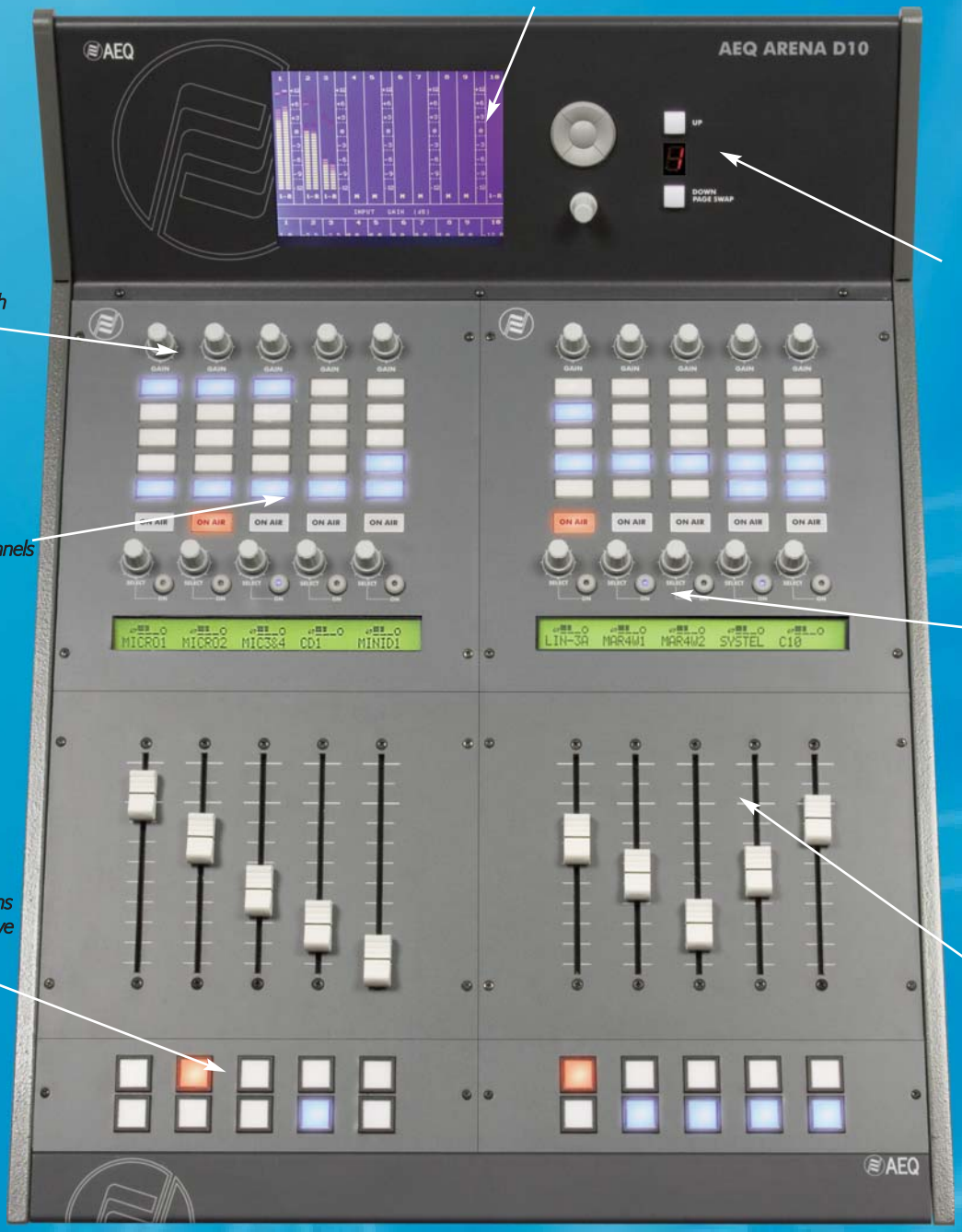
The latest features introduced enable the controls for each channel on the control surface to provide direct access to the main output buses or to the principal system functions. Direct front-panel access has also been facilitated to make maintenance work easier.

The ARENA also includes all the functions that were previously implemented in the BC 2000 D system, such as the option of simultaneously controlling several studios, or for example, as a Mix-Minus mixer with an unlimited number of n-1 circuits. In this operational mode faders are configured as I/O channels.

Arena Surface

The new ARENA control surfaces allow users to set up a modular control system especially designed for on-air broadcast applications.

ARENA D10


Display for VU meters, routing and signal adjustment
Page change buttons and display
Gain control in each channel
Different working modes for the channels
All the routing in a single button
The ON/OFF buttons can be placed above or below the fader
Motorised faders
AEQ
AEQ ARENA D10
UP
DOWN
PAGE SWAP
ON AIR
MICRO1 MICRO2 MIC384 CD1 MINID1
LIN-3A MAR4W1 MAR4W2 SVSTEL C10
AEQ

Two ARENA control surfaces are available: ARENA DM and ARENA D10. The DM has five channels and a control and monitoring section for all the signals in the system. The D10 has ten channels. Up to seven ARENA D10s can be linked to an ARENA DM. This makes it possible to create systems composed up to seventy-five fader channels. However, thanks to the use of pages and motorised faders, users can control a great many signals with a single DM control surface and just one or two D10 control surfaces.

ARENA DM

Display for VU meters, routing, CUE and signal adjustment

2 high precision digital VU me

Stereo CUE monitors included

Talkback microphone with PTT button

Central display for additional channel configuration and general system configuration

32 programmable keys

Independent monitoring area for studio and control room

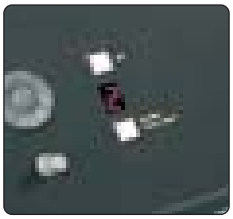
3 PTT buttons for direct talkback

Pages and Memories

More Control in Less Space

PAGES

Thanks to digital technology, the page concept provides users a greater number of signals in the final mix, with no need to have the corresponding control physically in sight. As the transition from one page to another is practically instant, not having direct physical access simultaneously to all channels is clearly offset by the saving in controls and space. The use of pages allows a better organisation of the distribution of signals assigned to each channel.



When one of the page change buttons is pressed, the channels present on the surface are replaced by the channels assigned to the new page, and the labels, fader positions and settings corresponding to each signal change automatically.

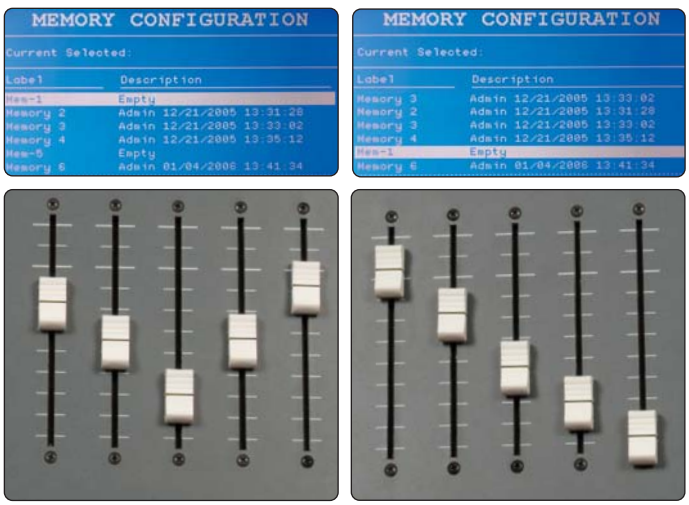
Each surface has capacity for up to nine pages. This makes it possible to simultaneously control as many as 45 signals on a single DM surface, and up to 90 on a D10 surface. Furthermore, the user can directly route any signal to any output without having to assign it to a control channel.

Of course, the assignment of signals to channels is totally user-definable. The user can also pre-assign any number of signals present in the system to one or more channels. In other words, a single channel can control a given signal at a certain time and another (different) signal at later on. This enables users to reorganise the distribution of channels so that the system can be adapted to different uses or programmes. In addition, the various assignments of signals to channels can be stored in memories for subsequent use

MEMORIES

ARENA users can work with memories that store the settings of each signal assigned to the channels on the first page. Since the system is especially designed for on-air applications, the change from one memory to another is protected so that the signals that are being broadcast remain unaltered. The transmission is thus never lost.

The use of memories makes it possible to adapt the system for the production of different programmes involving different technical requirements. The distribution of the signals over the surface is stored, as are the routing of each of those signals to the different output buses, or the parameters and activation of different digital FX.



Ease of Operation

Monitoring and Main Section

MAIN SECTION

The DM control surface has an additional display for general system administrative functions. This is a dual-purpose display, since the Select key for each channel can also be used to apply dedicated functions to a particular signal in a more precise way.

Among the functions are the control of DSP resources, IP address management, configuration and memories administration, the overall control of effects, the display of installed firmware and other utilities such as a timer, stopwatch .and clock

The Select key for each channel enables the execution of functions associated with the selected signal in the ARENA DM main display. These functions include specific signal settings, such as phase changes or to enable Phantom Power (if the signal in question is a microphone signal). The Select key also serves to insert a test signal (tone or noise) and to activate and adjust audio effects: equalization, filters, limiters, etc.

MONITORING

The ARENA control surface has a multipurpose screen that shows parameters that are specific to each channel, the routing of the signals present on the surface, and a VU meter for each signal present on the surface.

The DM control surface also offers two high precision digital VU meters that can be assigned to any signal. By employing programmable keys, the user can dynamically assign different signals to the main VU meters. Additionally, the DM control surface display has a VU meter dedicated to the CUE signal with an associated phase meter.

The ARENA DM has two sections for monitoring of the control room and the studio(s) that have been defined. In these sections there are independent level controls for the control room monitor, studio monitor and whatever headphone monitor circuits may have been defined in the system, as well as the CUE monitor speakers built into the surface itself.

A multi-studio situation can be defined that enables ARENA users to manage two or more studios independently from a single control room. This includes independent, centralised control of the ON-AIR signalling, the signals assigned to the monitors and headphones, the levels of those monitoring circuits, cough muting, remote PFLs, etc.

Ease of Communication

TALKBACK

As a control surface, the ARENA does not contain audio signals except for a few that permit the operation and control of the system. One of these signals is the microphone input that includes its own A/D converter. There are predetermined circuits between the ARENA surface and the studio - an independent one for the monitors and two headphone circuits.

Additional talkback circuits can be set up in the system to make communications management easier. For example, the user can program the sending of the DM control surface microphone to the various hybrid and audio codec returns.

This microphone input can also be used as an auto-control (Self-Op) microphone if desired.

PROGRAMMING ADDITIONAL FUNCTIONS

The ARENA DM has a large area where users can program special functions in a library that includes the definition of GPIs, GPOs, the control of hybrids and codecs, the management of different studios, etc.

Using the 32 available keys the user can also enable some of the options explained previously such as sending signals to the main VU meters or the establishment of additional communication circuits.

These programmable keys can also be used to completely convert the mixer into a multiplex system where channels become input / output channels, thus making it possible to manage whatever Mix-Minus or n-1 groups may be required.

CHARACTERISTICS OF THE ARENA 1 MIXER (1)

Functions

- Cough muting, ON-AIR signalling for studio and control room, fader start, remote PFL, talkback, automatic monitor cut-off
- Multi-studio control from a single ARENA DM surface
- Unlimited number of n-1 outputs
- Signal grouping option
- Integrated control over external equipment (AEQ hybrids and audio codecs)
- Configurable as Multiplex (Mix-Minus) mixer
- Independent pre-fader / post-fader option for all routings
- Print-out of the connection diagram of the inputs and outputs defined in the system
- Control communication through Ethernet 10/100 connection under TCP/IP protocol
- Selectable auto-startup option under which system starts with the last settings made or with the default configuration

General features of the DM and D10 control surfaces

- Signals assignable to any control channel
- Up to seven pages on each surface with option of synchronizing them with each other
- Configurable monitoring for all the signals in the system
- VU meters by channel on each surface
- Four channel control buttons that are configurable as a routing keyboard
- Storage in memory of the settings of all the signals assigned to the first page
- ON/OFF buttons that can be positioned above or below the faders
- Front panel extractable modules for easy maintenance

Particular features of the DM surface

- Stereo monitor speakers for pre-fade monitoring
- Input for talkback microphone with digital output
- Headphone output with digital input
- Two configurable precision digital VU meters
- Two headphone circuits and one independent monitor circuit for talkback
- Automatically adjustable timer and clock for each signal

Power and Versatility

TOTAL ROUTING

On each channel, users can activate or deactivate the sends, independently adjust the relative levels of all of them, and individually modify, without limitation, the pre-fader and post-fader assignment.

Any signal can be sent to any output, if the system is configured that way. It is also possible to select which routings will be available to the operator and which will be fixed.

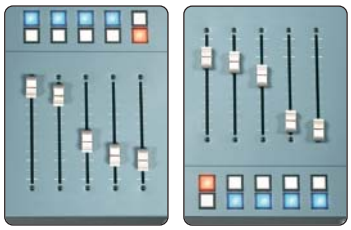
The routing power of the system is so great that it enables its users to work by sending all the inputs to all the outputs, in any combination, and to control all the basic routing parameters from the surface.

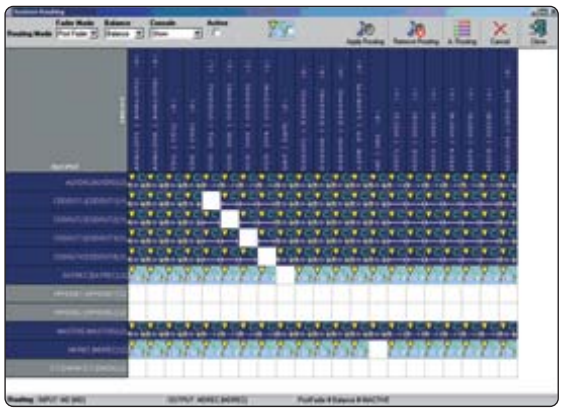
ADAPTATION TO DIVERSE APPLICATIONS

The ARENA control surface adapts to different working modes. Depending on the needs imposed by each situation, the controls can perform different functions that will be suited to each purpose.

The control surface channel controls can be programmed to provide access to typical functions, to work as direct routing keys, or be converted for use as I/O channels.

Additionally, the new ARENA is physically configurable. Thanks to its modular design, the user can place the ON/OFF or CUE buttons above or below the faders on the same piece of equipment.





CHARACTERISTICS OF THE ARENA MIXER [2]

Inputs and outputs

- Maximum capacity for 21 input / output modules
- Phantom power and transformer balancing for microphone inputs
- Electronically balanced line inputs and outputs
- Transformer-balanced digital inputs and outputs
- Independent sample rate converters for the inputs and outputs
- Accepts AES/EBU, S-PDIF and MADI digital signal formats
- MADI connections via coaxial cable or optical fibre (available in single mode and multimode)
- Four GPIs and four GPOs on each input / output board (analogue, digital and microphones)

System processing capacities

- Redundant power supply and optional DSP module redundancy
- Capacity for up to 20 DSP modules
- Internal sampling rate: 48 kHz at 24 bits
- Internal bus: 32 bits in floating point
- Gain control (digital and analogue signals): ± 12 dB
- Selectable balance / pan control for all channels
- Selective phase inversion
- Available audio effects: four-band parametric equaliser, high and low pass filters, compressor-limiter, noise gate, delay, reverb

Dimensions and weight

- Main unit: 6U x 19" (482.6 x 266.7 x 450.0 mm; from 12 to 22 Kg)
- Power supply: 2U x 19" (482.6 x 89.0 x 360.0 mm; 8.2 Kg)
- ARENA DM: (458 x 260 x 605 mm; 11.2 Kg)
- ARENA D10: (458 x 260 x 605 mm; 11.0 Kg)

System Components

BC 2291 POWER SUPPLY

The BC2291 power supply accepts 90-240 V AC (50-60 Hz). It occupies one standard rack unit. It includes one hot-swappable module capable of supplying 300 W of power, enough to feed a system with all of its boards.

BC 2290 POWER SUPPLY

The BC2290 redundant power supply occupies two standard rack units. It includes two hot-swappable modules. If one of the modules develops any kind of problem, the other one will automatically assume the power supply duties.

ARENA D10 CONTROL SURFACE

ARENA DM CONTROL SURFACE

Now with two finishes: blue control panel with wood side panels or grey control panel with black side panels.

BC 2000 DF

This is the chassis or frame into which all the system boards are inserted. It occupies four rack units and accepts 21 input / output modules and a maximum of 20 DSP boards.

Typical Configuration

AUDIO MIXER FOR BROADCASTING:

- 1 Control surface, monitoring with loudspeakers, LCD displays and five motorised faders (ARENA DM)
- 1 Extension control surface of 10 motorised faders and LCD configuration display (ARENA D10)
- 1 External power supply (BC-2291 or BC-2290)
- 1 Frame to house audio, control and DSP boards (BC-2000 DF)
- 1 Master controller module (BC-2230)
- 4 DSP boards for audio processing (BC-2220)
- 3 boards with 4 mono analogue line inputs - outputs with GPI/O (BC-2201)
- 2 boards with 4 AES/EBU - SPDIF digital inputs -outputs with GPI/O (BC-2202)
- 1 board with 4 transformer-balanced microphone inputs and 2 stereo headphone outputs (BC-2203MH)

CONFIGURATION FEATURES

15 PAGEABLE FADERS
7 AES-EBU / SPDIF DIGITAL STEREO INPUTS
4 AES-EBU / SPDIF DIGITAL STEREO OUTPUTS
4 TRANSFORMER-BALANCED STUDIO MICROPHONE INPUTS WITH PHANTOM POWER
12 ANALOGUE LINE INPUTS
12 ANALOGUE LINE OUTPUTS
2 HEADPHONE OUTPUTS (PRIMARY AND SECONDARY HEADPHONES)

BC 2000 DF Frame Modules

BC 2211

BC 2230

BC 2202

BC 2230 CONTROLLER MODULE

The controller board is the brains of the system. It receives power from the BC 2290 power supply, establishes control of the system, synchronisation and communications between the BC 2000 DF frame and the various components installed in the network.

BC 2220 DSP BOARDS

Depending on the size and features of the system, each frame will need between four and 20 of these digital processing modules. The DSP boards perform different types of functions: routing, mixing, signal processing effects, display of levels on the screen, etc. They can be redundant to guarantee system operating continuity.

BC 2201 ANALOGUE AUDIO INPUT / OUTPUT MODULES

Each BC 2201 module consists of four analogue inputs and four mono analogue outputs, which can be defined at will as stereo signals. All these inputs and outputs are electronically balanced. The signals are connected by means of RJ-45 connectors, each of which groups together four input and four output signals. Also available are general purpose inputs and outputs that can be used, for example, to control external equipment. Four GPIs and four GPOs are present in two RJ-45 connectors oneach I/O board.
There are also modules available with only four analogue mono inputs (BC 2204) or only four analogue mono outputs (BC 2205).

BC 2202 DIGITAL AUDIO INPUT / OUTPUT MODULES

This module provides four digital stereo inputs and four outputs in AES/EBU format, which are individually configurable as SPDIF format signals. They are all insolated by transformer and have independent sample rate converters (SRC) for the input and output; the sample rate of each of the outputs can be individually configured.

A BC 2202 module is responsible for controlling the basic signals of the ARENA DM surface: main VU meters, control headphones, talkback microphone and CUE monitors. Like the rest of the input / output modules, the BC 2202 has four GPIs and four GPOs.
Also available are modules with only four inputs (BC 2206) or only four outputs (BC 2207).

BC 2203M ANALOGUE MICROPHONE AND LINE INPUT MODULE

This module provides four mono inputs that are configurable as microphone or line inputs; they are all electrically insolated by transformer. Each input can supply phantom power required for electrostatic microphones. This module also offers four GPIs and four GPOs. Phantom power and mic / line switching are activated from the ARENA control surface.

BC 2203MH ANALOGUE MICROPHONE / LINE INPUTS AND HEADPHONE OUTPUT MODULE

In addition to the characteristics of the microphone module described above, the BC 2203MH includes two stereo outputs for headphones.

BC 2211 MADI CONNECTION MODULE

This module provides an optical fibre or coaxial cable link that carries an AES 10 MADI signal, with sufficient capacity for 56 or 64 channels. The inclusion of this module enables integration with other equipment items that have the same type of link; this allows a larger system to be configured based on the BC 2000 D router, or simply enables the system to be linked with another mixer.
There is a special version for long-distance links (BC 2211HP).

BC2000 CAB WIRING AND CONNECTION SYSTEM

There is a complete, versatile system to connect any signal source.
There are different modules (XLR and Wago) available that ease system assembly.

AEQ

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AEQ USA

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